CLAIMS

1. A fixing apparatus, comprising a pair of structural members each having an engagement groove formed in at least one side surface thereof, said engagement groove being provided at two side wall surfaces thereof with two protrusions protruding toward each other, an end face of one of said pair of structural members, when said pair of structural members are fixed to each other, being abutted with one side surface of the other structural member such that one side surface of said one structural member is intersected with one side surface of the other structural member,

characterized in that said fixing apparatus comprises

an abutment member abutted with one side surface of each of said pair of structural members;

a first engagement member having two engagement parts capable of engaging the respective protrusions formed on the respective one side wall surfaces of said engagement grooves of said pair of structural members such that said two engagement parts are unable to escape outside from inside of said engagement grooves, said two engagement parts of said first engagement member being disposed at the respective side parts of said first engagement member on the side of said pair of structural members;

a second engagement member arranged in the widthwise direction of said engagement grooves in such a manner as to be opposite to said first engagement member and having two engagement parts capable of engaging the respective protrusions formed on the other side wall surfaces of said engagement grooves of said pair of structural members such that said engagement parts are unable to escape outside from inside of said engagement grooves, said two engagement parts being disposed at the respective side parts of said second engagement member on the side of said pair of structural members;

a female screw member disposed at said first and second engagement members in such a manner to be non-movable in a direction away from the respective one side surfaces of said pair of structural members;

a male screw member passed through said abutment member and threadingly engaged with said female screw member;

said first and second engagement members being displaceable between an inserting position where said engagement parts can be brought into and out of said engagement grooves through the opposing surfaces of said protrusions and an engaging position where said engagement parts can be engaged with said protrusions such that they cannot escape outside from inside of said engagement grooves, in a widthwise direction of said engagement grooves toward/away from each other;

biasing means being disposed between said first engagement member and said second engagement member, said biasing means biasing said first and second engagement members in a direction away from each other so that said engagement parts are displaced into the engaging position;

when said male screw member is tightened, said abutment member being brought into abutment with the respective one side surfaces of said pair of structural members and the respective engagement parts of said first and second engagement members located in said engaging position being brought into abutment with the corresponding protrusions of said pair of structural members from inside of said engagement grooves to outside, thereby fixing said pair of structural members each other.

2. A fixing apparatus for a structural member according to claim 1, further comprising a holding member for holding said first and second engagement members such that said first and second engagement members are displaceable between at least said inserting position and said engaging position such that said first and second engagement members can displace in the widthwise direction of said engagement grooves toward/away from each other.

3. A fixing apparatus for a structural member according to claim 2, wherein said holding member is elastically deformable and said holding member is used also as said biasing means so that elastic deformation of said holding member causing said first and second engagement members to be displaced toward each other from said engaging position to said inserting position and elastic restoration of said holding members causing said first and second engagement members to be displaced away from each other from said inserting position to said engaging position.

4. A fixing apparatus for a structural member according to claim 1, one and the other ends of said female screw member in the width direction of said engagement groove are integrally disposed at the respective side parts away from said pair of structural members of said pair of engagement members, intermediate parts of said first and second engagement members between a side part where said female screw part is disposed and a side part where said engagement part is disposed are elastically deformable so that the engagement parts of said first and second engagement members are displaceable toward each other from said engaging position to said inserting position, and said intermediate parts also serve as said biasing means so that elastic restoring deformation of said intermediate parts causes said first and second engagement members in a direction away from each other from said inserting position to said engaging position.

5. A fixing apparatus for a structural member according to one of claims 1 through 4, wherein said abutment member is provided with positioning parts which are fitted to the respective engagement grooves of said pair of structural members such that said positioning parts are non-movable in the widthwise direction of said engagement grooves.

6. A fixing apparatus for s structural member according to one of claims 1 through 5, wherein said abutment member is provided with a displacement prohibiting part which is brought between said pair of engagement members

located in the engaging position, thereby prohibiting said pair of engagement members from being displaced toward each other to the inserting position.